

WHAT IS CLAIMED IS:

1. A photovoltaic device, comprising:
 - a photovoltaic conversion layer formed from photoactive material;
 - a first electrode arranged on a first surface of the photovoltaic conversion layer;
 - a second electrode comprising one or more conductive tracks arranged on the opposite second surface of the photovoltaic conversion layer to receive generated photoelectrons from said photovoltaic conversion layer; and
 - a light concentrator adjacent to said second electrode wherein the one or more conductive tracks are arranged in registration with said light concentrator such that incident light is guided substantially through gaps between the one or more conductive tracks.
2. A device according to claim 1, in which the second electrode comprises a transparent conductive layer in electrical communication with said one or more conductive tracks.
3. A device according to claim 2, in which the transparent conductive layer incorporates a metal oxide.
4. A device according to claim 2, in which the transparent conductive layer incorporates a conductive polymer.
5. A device according to claim 1, in which the conductive tracks are made of metal.
6. A device according to claim 1, in which the conductive tracks are made of a carbon-based material.
7. A device according to claim 5, in which the metal is selected from the group consisting of gold, aluminium, nickel, copper, chromium, silver and alloys thereof.

8. A device according to claim 1, in which the light concentrator comprises a transparent support layer having one or more light concentrating units arranged thereon.

9. A device according to claim 1, in which the photovoltaic conversion layer is isotropic over an area which is greater than the area occupied by two light concentrating units.

10. A device according to claim 8, in which the light concentrating units incorporate refractive structures.

11. A device according to claim 8, in which the light concentrating units incorporate diffractive structures.

12. A device according to claim 8, in which the light concentrating units incorporate reflective structures.

13. A device according to claim 1, in which the one or more conductive tracks are connected to form a conductive network.

14. A device according to claim 13, in which the width of the one or more conductive tracks is varied across the device.

15. A device according to claim 8, in which the degree of concentration provided by each of the one or more light concentrating units corresponds to the width of the conductive tracks surrounding the region illuminated by the corresponding light concentrator.

16. A device according to claim 1, further comprising a contact area for each of and in electrical communication with the first and second electrodes for connection to an external circuit.

17. A method of manufacturing a photovoltaic device, comprising the steps of:

providing an electrode comprising one or more conductive tracks on a first surface of a transparent support, the transparent support having a light concentrator arranged on its opposite second surface, the one or more conductive tracks being arranged in registration with the light concentrator;

forming a photovoltaic conversion layer on said first surface of the transparent support, to cover said one or more conductive tracks; and

forming an electrode layer on said photovoltaic conversion layer, such that the photovoltaic conversion layer is arranged between the electrode layer and the one or more conductive tracks.

18. A method according to claim 17, in which the step of providing one or more conductive tracks on the first surface of the transparent support, comprises:

(a) coating the first surface of the transparent support with a photosensitive material;

(b) exposing said photosensitive material through the light concentrator to define a pattern corresponding to the light concentrator in said photosensitive material;

(c) removing either said photosensitive material exposed to said light or said photosensitive material not exposed to said light;

(d) depositing a thin conductive layer on the resultant photosensitive material structure;

(e) removing said photosensitive material not removed in step (c) together with the thin conductive layer covering said photosensitive material, leaving a layer of thin conductive tracks on said transparent support.

19. A method according to claim 18, in which the photosensitive material is photoresist.

20. A method according to claim 18, in which the photosensitive material is a silver halide photosensitive material.

21. A method according to claim 18, further comprising, between the step of providing one or more conductive tracks, and the step of forming a photovoltaic conversion layer, the step of coating said conductive tracks and the surface on which they are positioned with a material for forming a transparent conductive layer.

22. A method according to claim 18, further comprising, prior to the step of providing one or more conductive tracks, the step of coating said first surface of the transparent support with a material for forming a transparent conductive layer.